

# Modified Completion Report

## Monitoring Procedures and Methods

Revised April 9, 2003 (Page one was revised, and list of 2003 randomly selected THPs was appended.)

### Overview

The objective of the Modified Completion Report (MCR) is to provide abundant data on the adequacy of the implementation and effectiveness of those Forest Practice Rules (FPRs) specifically designed to protect water quality and riparian/aquatic habitat, using information collected during Timber Harvest Plan (THP) inspections, specifically the completion report inspection(s) and the erosion maintenance period inspection(s).

MCR includes three methods:

- 1) WLPZ Canopy/Surface Cover Sampling Method**
- 2) Road Sampling Method**
- 3) Watercourse Crossing Sampling Method**

These methods will be applied to a random selection of 25%<sup>1</sup> of all THPs, as they are completed. On each randomly selected THP, four sample sites will be selected randomly for monitoring: 1) a 200 foot segment of Class I or II WLPZ, 2) 1000 feet of road, and 3) two class I, II or III watercourse crossings. In the event a suitable sample site is not available on a randomly selected THP, the method form should be turned in with a notation: "Not applicable to this THP."

All four sites will be monitored for implementation at the time of the final Completion Report inspection(s). The sample road segment and sample watercourse crossings effectiveness of the drainage structures, will be monitored a second time for effectiveness during the post-completion erosion control maintenance period inspection(s), after at least one overwintering period. Information to be recorded includes erosion features present (if any), source and cause of the features, impact to water quality, and adequacy of crossing design and construction.

The forms for doing MCR monitoring are attached to these instructions in the Appendices and are suitable for photocopying. Copies of the completed forms along with a photocopy of the THP map showing the location of the sample sites should be sent to

California Department of Forestry and Fire Protection  
P.O. Box 944246  
Sacramento, CA 94244-2460      Attn: Clay Brandow, Resource Mgmt.

Instruction on selecting the sample sites and completing the forms in field is available by contacting Clay Brandow, watershed-monitoring specialist, at [clay\\_brandow@fire.ca.gov](mailto:clay_brandow@fire.ca.gov) or (916) 653-0719.

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<sup>1</sup> Note that this percentage is subject to change based on staffing levels and workload. Currently a 12.5% sample represents about 125 THPs per year. The sample size was revised downward from 25% to 12.5% on 2-25-02.

## **Random Selection of THPs**

MCRs will be preformed on 12.5% of THPs, randomly selected. Located in the appendices are two lists of randomly selected THP numbers. The first list (Appendix A-1) is for THPs dated 1990 through 1999. The second list (Appendix A-2) is for THPs dated Year 2000. Each year, starting in 2001, the watershed-monitoring specialist will generate a new list of randomly selected numbers from R-YY-001 through R-YY-999 that will apply to the THPs filed that year. To keep it simple, the lists are the same for all regions. This does not affect the randomness of the sample. The lists are the same for all THPs, and the numbers that match the numbers on the list are those selected for MCRs. The lists are generated in such a way that approximately 25% of the THPs each year are selected for monitoring, regardless of the total number of THPs approved by each Region each year. The program for generating these lists was written by Tim Robards in collaboration with Clay Brandow.

## **1) WLPZ Canopy/Surface Cover Sampling Method**

This procedure is to be completed once during Phase I (the Completion Report inspection.) The MCR method for WLPZ canopy/surface cover sampling is a modified version of Procedure 1 of the PHI and potential enforcement actions method developed by Robards (1999). The number of sighting tube observations is 50, as compared to 100 for the enforcement procedure. The inspector will also record the average WLPZ width based on pacing within the segment sampled for canopy cover. Additionally the inspector will note and record fresh erosion features in the sample segment (i.e. gullies, rills, or areas of sediment deposition).

Using a similar WLPZ canopy/surface cover sampling method to that used for PHIs, enforcement, and MCRs has several advantages, including simplicity, continuity, and reducing the need for additional training. Also the data will be comparable. The enforcement data represents the worst-case post-harvest WLPZ conditions, while MCR represents the average WLPZ conditions. Over time the MCR data will allow us to look at trends in average post-harvest WLPZ conditions.

**Selecting a sample WLPZ segment.** The MCR method differs from Procedure 1 in the way the sample WLPZ segment is selected. Rather than selecting the least stocked reach for sampling, as in the enforcement method, in the MCR method the inspector will break the affected reaches of Class I and II watercourses into 200-foot long segments on the THP map and number the segments. The inspector will then use a random number to choose one 200-foot long segment from the numbered reaches for sampling. Where only one side of the creek was harvested, that side will be measured. Where both sides of the creek were harvested, a flip of a coin will be used to will determine whether to measure the right or the left bank of the WLPZ.

**Sampling Procedure.** Regardless of the size of the area, 50 points will be the target sample size. The following formula calculates the distance (D) between points. Width and length refer to the width and length of the WLPZ section to be sample.

$$D = \sqrt{\frac{\text{width} \times \text{length}}{50}}$$

Since for MCRs the sample length is a standard 200 feet, this equation can be simplified, as follows:

$$D = 2\sqrt{\text{width}}$$

For standard widths of 50, 75, 100 and 150 feet, D is 14, 17, 20 and 28 feet, respectively.

The WLPZ width to utilize when calculating D is the width stated in the THP. Once the field sampling begins, continue to use the calculated D, even if the actual WLPZ width flagged on the ground is considerably wider than that stated in the plan. If the WLPZ width varies due to slope and the flagging results in a narrower WLPZ than was anticipated, do not take a sample point above the flag line. Simply turn 90 degrees and begin a new line going in the downhill direction. Stop when 50 points are achieved, regardless of whether this results in a line being completed.

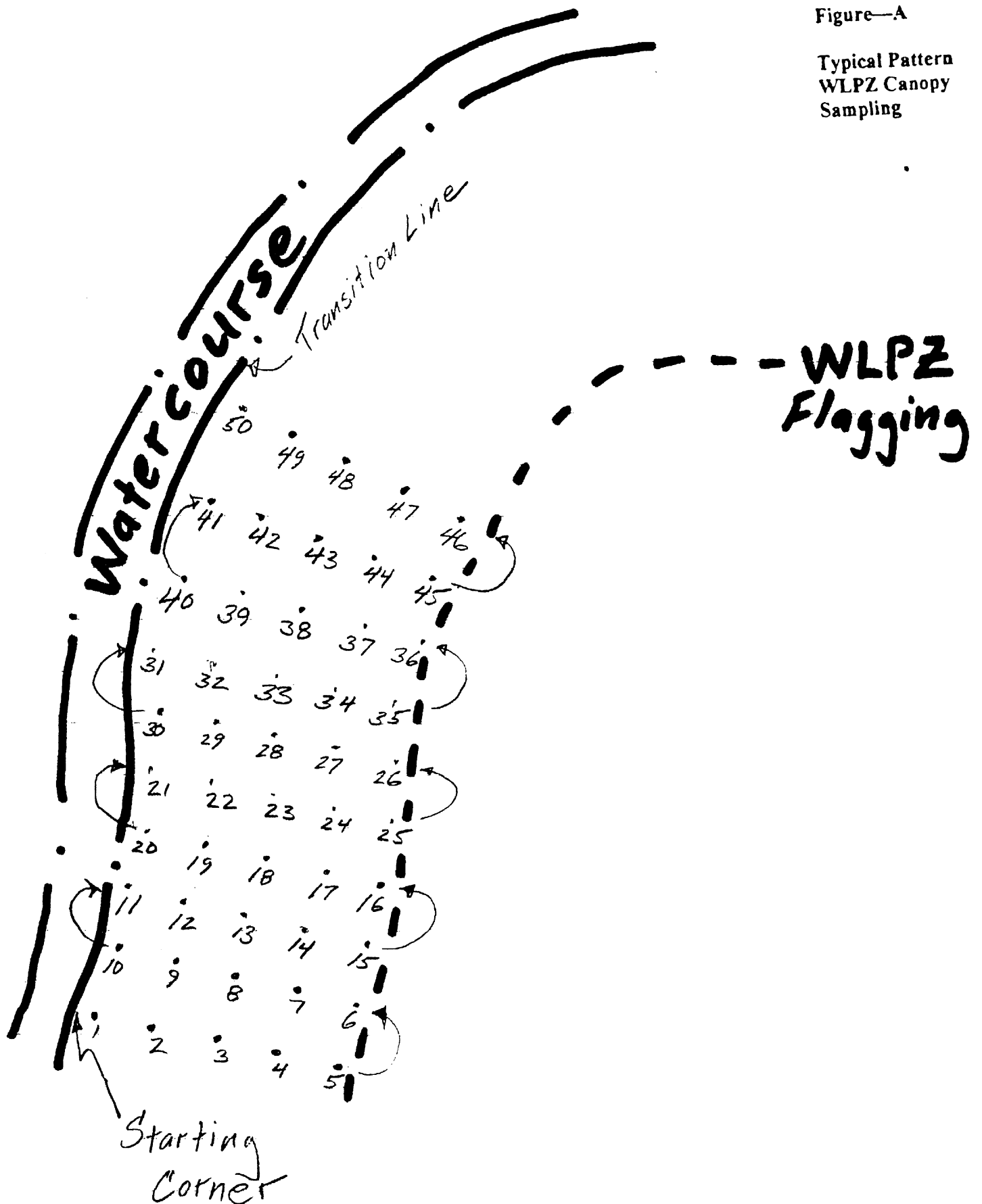
Start in the corner of WLPZ section. The first point will be selected randomly. To make a random selection for your first distance from the corner, use a random numbers between 0 and 1. If using the random number table, place the decimal point in front of the series of 5 digits. Multiply the random numbers by D. Pace those distances perpendicular and parallel to the watercourse transition line. This is your first point. Collect total canopy data for this point using a vertical sighting tube (i.e., do not try to differentiate between overstory and understory vegetation). Pace D feet to the next point on the line perpendicular to the watercourse. Continue to collect points on the line until the next point will exit the WLPZ. Then change direction 90°, pace D feet, and start a new line. The resulting pattern will look something like Figure--A.

When using the vertical sighting tube at each point, first level it using the horizontal and vertical bubbles. Align the dot center by holding the tube steady and moving your head to put your eye in the correct position. The dot is then evaluated as to whether it intercepts overstory. Hits are recorded as “+” in the hit column and misses are recorded as “-” in the miss column on the form provided. Figure--B is a completed sample form. A blank form, suitable for photocopying, is included in appendix A-3. If deciduous trees are encountered in the winter without leaves, it is permissible to assume that leaf cover would be present in the summer months.

Additionally, the inspector will note and record fresh erosion features in the sample segment on the form located in appendix A-4. A check box for “No erosion features observed in the sample WLPZ segment” is provided on this form. In the event there are erosion features present, at each point in the sample WPLZ segment where erosion or deposition is observed, note the nearest canopy sample point by number, the type of erosion feature (i.e. gully, rilling, or areas of sediment deposition), and the feature’s approximate size (width, depth, and length) in feet. Figure--C is completed sample form. Record each erosion feature (e.g. gully, rill) only one time, even though it may be observed at several sample points.

Figure—A

Typical Pattern  
WLPZ Canopy  
Sampling



# Modified Completion Report WLPZ Canopy Sampling Form

Revised 10/16/2000

THP No. 4 - 97 - XXX  
Observer(s) Tom Francis / Clay Brandon  
Date 9-13-00

Estimate total length of Class I stream in this THP 3500 feet.  
Estimate total length of Class II stream in this THP 700 feet.  
(Count the number of 200 segments delineated on the THP map for the random selection of a sample 200 foot WLPZ segment and multiply by 200. Needed for statistical analysis.)

Watercourse selected for sampling:

Watercourse Name Map 1A Trib to Basin Cr.  
Watercourse Class I or II (circle one)

Target WLPZ sample length is 200 feet.  
Actual WLPZ sample length 200 feet

Prescribed WLPZ width (from THP) 50 feet  
Actual WLPZ width (based on flagging) 50 feet  
Sampled WLPZ width 50 feet

D = Distance between sample points.

$D = 2\sqrt{\text{width}} =$  14 feet.

For standard widths of 50, 75, 100, 150, and 200 feet.

D is 14, 17, 20, 24, and 28 feet, respectively

$100 \times (\# \text{ of Hits}) / (\# \text{ of Hits} + \# \text{ of Misses}) =$

62 % Canopy Cover

## Ocular estimates (within WLPZ sample segment).

Harvesting in WLPZ segment this entry? YES NO (circle one)

% Canopy removed this entry? <10% 10-30% 30-50% (circle one)

Understory Canopy remaining  $\geq 50\%$ ? YES NO (circle one)

Overstory Canopy remaining  $\geq 50\%$ ? YES NO (circle one)

T&I planning watersheds/Class I watercourses only.

overstory meets T&I standards: N/A YES NO (circle one)

WLPZ Groundcover (live & dead) is  $\leq 70\%$  or  $> 70\%$  (circle one).

Untreated patches of bare mineral soil in WLPZ ( $\geq 800 \text{ ft}^2$  or as specified in the THP) are: Absent or Present (circle one).

Points	Hit (+)	Miss (-)
1.	+	
2.	+	
3.	+	
4.		-
5.	+	
6.	+	
7.	+	
8.		-
9.	+	
10.	+	
11.		-
12.		-
13.		-
14.		-
15.	+	
16.	+	
17.	+	
18.	+	
19.	+	
20.	+	
21.	+	
22.	+	
23.	+	
24.	+	
25.		-
26.		-
27.		-
28.	+	
29.	+	
30.		-
31.		-
32.		-
33.		-
34.		-
35.	+	
36.		-
37.		-
38.		-
39.	+	
40.	+	
41.		-
42.	+	
43.	+	
44.	+	
45.	+	
46.	+	
47.	+	
48.	+	
49.	+	
50.		-
Totals	31	19

# Modified Completion Report WLPZ Erosion Features Form

Revised 4/2/01

Page 7  
Figure--C

Page \_\_\_\_ of \_\_\_\_

Observer(s) Tom Francis / Clay Brandon Date 9-13-0

THP No. 4 - 97 - XX

Name of Affected Watercourse 1-A Trib to Basin Creek

Check one:

☐ No erosion features observed in sample WLPZ segment.

☒ Erosion features observed in sample WLPZ segment and described below.

Point Number (Nearest WLPZ canopy measurement point.)	Erosion Feature Type (Gully, rills, or sediment deposition.)	Width (feet)	Depth (feet)	Length (feet)	Comments (source of the sediment) (cause of the problem) (deposition to the channel)
45	Gully	2	1.5	16	Originate at skid trail just outside WLPZ. Deposition in channel.

## 2) **Road Sampling Method**

This procedure is completed twice on the same randomly selected 1000-foot long road segment: once during the Completion Report inspection), and then repeated during erosion control maintenance period after at least one overwintering period.

Locations to record hillslope erosion are randomly selected to provide an unbiased estimate of erosion. To select the randomly located road transect, the inspector begins by locating the 1:24,000 scale map included as part of the THP. All the roads within or bounding the THP unit(s) are highlighted or otherwise noted. A compass or dividers is then set for 500 feet (based on the map scale) and segments are “walked off”. Each segment is assigned a number and it is written on the map. High precision is not critical for this exercise; if the road curves, it is permissible to simply call the segment the distance from two points on the arc of the curve (i.e., do not try to use a map wheel to get accurate distances in curved segments). The beginning point on the THP map is not important, but a logical beginning point makes the process more efficient. Segments slightly more or less than 500 feet are acceptable. The goal is to get a quick assignment of segments for the roads in the THP. From this pool of road segments, a random number generator or a random number table is used to randomly select one road segment. A different colored highlighter pen can be used to clearly show on the THP map the road segment chosen.

For example, if there are 8 road segments in the THP with lengths of about 500 feet, the task is to randomly determine which should be sampled in the MCR program. Assume that the random number table has the following entries: 59463 21810. Select the road segment that corresponds to the first random number between 1 and 8. In this example, the selected first road segment to sample is the one labeled 5.

The task is slightly more complicated if there are 10 or more road segments. Suppose for example that there are 15 road segments denoted for the THP under review. In this case, use pairs of random numbers to select the desired locations. Assume the random number table has the following entries: 22662 65905 70639 79365 12900. Select the road segment that corresponds to the first pair of random numbers that corresponds to a possible road segment. In this case, 22, 66, 26, and 59 all do NOT correspond to a possible road segment. However, 05 does and it is picked.

Remember when using the random number table to cross off numbers used in randomly locating features, so that new numbers are continually being used.

To locate the starting location along each of the selected road segments, walk or drive to the approximate center of the 500-foot segment (based on easily observable landscape features, such as streams, road junctions, etc.). A coin is flipped (heads means forward in the direction you were going, and tails means backwards) and the inspector travels to the closest landing used in the THP under review (note that this could be beyond the 500-foot segment).

This landing is the starting point of the road segment. A coin is again flipped to determine the direction to travel for completing the road transect. If the inspector is at or near the end of a spur, there is no need to flip a coin; rather the transect utilizes the road segment available. If the spur hits a more permanent road junction (or even an appurtenant road for the THP if there is not enough road length in the plan), the inspector continues forward to evaluate the entire 1000 feet required. In general, if there is a choice which direction to go at the junction (that is the road is in the THP or bounds it and was used for hauling in both directions), the inspector will choose the road that is of the same type of construction and level of use as the transect up to that point. If both road forks are of similar construction and level of use, the inspector will choose the road traveling in the same basic direction as the transect. Where there is no substantial difference in construction and level of use, and there is no clear difference in direction relative to the transect, a coin flip will be used to determine which road to follow. The direction chosen will be described in the comments section, so as to provide a record for the Phase 2 inspection. If the inspector ends up with 800 feet of road at the end of a spur, it is permissible to consider this to be a legitimate sample. If the distance is less than 800 feet, the ending distance will be noted, and the inspector will go back to the starting point (**NOT** re-zero the string box counter) and continue in the opposite direction until 1000 feet of road are sampled.

Roads within or bounding the THP will always be given the highest priority for this work; appurtenant roads will only be used when a randomly chosen transect leaves the THP.

**ROADS TRANSECT FORM INSTRUCTIONS.** A copy of the form for evaluating the sample road transect, suitable for photocopying is provided in Appendix A-4. This form is be filled out twice: once during the Completion Report inspection and once during the erosion maintenance period inspection (or after the erosion control features have been through one or more winter seasons.) An example of this form filled-out for the first inspection is contained in Figure D.

First complete the header by recording the observers name, the date, the THP number, whether this is Phase 1 or 2 inspection, the road type, the transect number.

Next fill out the body the body form while walking the sample road segment from the starting point (zero) to end of the segment (typically 1000 feet). The form has 16 columns labeled “A” through “P”. Columns “A” through “F” under “Implementation” are to filled-out during Phase 1, during Completion Monitoring. Columns “G” though “O” under “Effectiveness” are to be filled-out during Phase 2, erosion control maintenance monitoring. Here is what goes in each of the columns:

Record erosion features that are recent and that could relate to the current THP; do not record older features that are clearly unrelated to the plan under review. It is important to remember that more than one Forest Practice Rule may apply to a given feature; record and rate implementation of all the applicable rules.

Observer: Brandon/Francis Date: 9/13/00 THP No.: 4-97-XXX Road Type: Seasonal Trans. No.: 1

# COMPLETION REPORT MONITORING: ROADS AND SKID TRAILS FORM

ID#	Feature Code	Implementation (1)		Effectiveness (2)						Sediment (3)		Comments			
		Rate No.	Cum. Dist. (ft.)	Effect. Code	Drainage Problems Code (3)	Source Code	Erosion Problems (3)			Dep. Code	WC Code				
							Begin	End	W				D	L	
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)
10	Begin		0												Temp. Rd. Landing = start
20	NL		30	40	MA										
30	WB	914.66	165	170	MA										Road Block start End of Temp. Road
40	WB	+	219	243	A										
50	WZ	913.2	274	309	A										
60	WB	914.6	382	394	A										
70	NL		646	676	A										Outside berm
80	OB		+	783											
90	WB	914.6	783	796	A										
100	OB		796	909											
110	NL		909	928	A										
120	OB		928	993											
130	NL		993	1009	D										END
				END											Outside Berm Along entire Road

10/4/00 rev.

- (1) Complete columns A-F for implementation evaluation.
- (2) Complete columns E-O for all rows during effectiveness evaluation. (G)
- (3) Complete columns H-O only when drainage or erosion problem is noted.
- (A) Consecutive numbers for each feature.
- (B) One rule per row, use code sheet 1.
- (D-E) As shown by string box
- (F) Enter implementation code as described in instructions.
- (G) Enter effectiveness code as described in instructions.
- (H) Enter all codes that apply, use code sheet 2.
- (I) Enter the single code that applies, use code sheet 3 Feature Code
- (J) Enter all codes that apply, use code sheet 3.
- (K-M) Estimate to 1 place when <1 ft. and to 2 places when >1 ft. (eg. .5, 1.5, 1.5, 150)
- (N-O) Enter single codes that apply, use code sheet 3.

## Implementation factors to be evaluated

**Column A** – ID#: Enter unique, consecutive number for each row (for example 10, 20, 30, 40, 50.....)

**Column B** – Feature Code: Enter the code(s) describing any erosion, drainage, crossing, special mitigations, or other listed features that are encountered as part of the transect.

### Erosion Features

R	=	Rilling (see below)
G	=	Gullying (see below, includes ditch erosion)
M	=	Mass failure
S	=	Cutbank or sidecast sloughing
OE	=	Other erosion feature (describe in comments).

Rills = Small surface erosion channels that (1) are greater than 2 inches deep at the upslope end when found singly or greater than 1 inch deep where there are two or more, and (2) are longer than 20 feet if on a road surface or of any length when located on a cut bank, fill slope, cross drain ditch, or cross drain outlet. Do not record the dimensions (form columns J-L) of rill erosion features.

Gullies = Erosion channels deeper than 6 inches (no limitation on length or width). Estimated gully dimensions should be recorded in form columns J-L.

Erosion channels on a road surface or in an inside ditch that start as rills and grow to the depth of gullies should be recorded as separate rill and gully features.

Erosion channels on cuts, fills, and cross drains should be recorded as gullies if any part is deeper than 6 inches

### Drainage Collector Features

WB	=	Waterbreak
RD	=	Rolling dip
NL	=	Natural low point
HP	=	High point
CU	=	Culvert
ID	=	Inside ditch
OB	=	Outside berm (water confined on road by pushed up soil)
OD	=	Other drainage features (describe in comments)
LD	=	Leadoff ditch
OS	=	Out slope
IS	=	In slope

Note: Begin and end inside ditch features at starting and ending points of the ditch, at functioning cross drains, and where the direction of flow in the ditch changes.

## (Column B continued)

### Watercourse Crossing Features

(identify points at which the road or skid trail crosses or directs runoff into a channel or draw, use the same string box distance as recorded for an adjacent drainage feature that discharges directly into the watercourse, and complete Watercourse Crossing form for designated watercourses)

W0	=	No class channel
W1	=	Class I watercourse
W2	=	Class II watercourse
W3	=	Class III watercourse
W4	=	Class IV watercourse

### Special Mitigations Features

(use for mitigations exceeding Rule requirements)

OM	=	Other mitigations (describe in comments)
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### Other Features

(Includes rule and THP requirements)

NS	=	Non-standard practice (describe in comments and on site evaluation form)
BR	=	Berms not removed
CO	=	Overhanging cut banks
RE	=	Roots exposed
EG	=	Excessive road grade
RT	=	Rut(s)
WS	=	Wet spot
RC	=	Road surface settling
TR	=	Tension crack in road surface or fill
OG	=	Organic debris in fills
SF	=	Fill on slopes >65%
LM	=	Lack of mitigation on slopes >65% or on slopes >50% within 100 ft. of the WLPZ
UF	=	Untreated fill with access to WLPZ
RS	=	Road slash near streams
RA	=	Roads on unstable areas without mitigation
SU	=	Skid trail intersection upslope (measure at midpoint)
SD	=	Skid trail intersection downslope (measure at midpoint)
RU	=	Road intersection upslope (measure at midpoint)
RL	=	Road intersection downslope (measure at midpoint)
OF	=	Other features (describe in comments)

**Column C** – Rule No: Enter the Rule number for the Forest Practice Rule that has or should have been implemented. Rules to be evaluated are listed on the pick list below. Example, “Are drainage structures and facilities of sufficient size, number, and location to carry runoff water [923.2(h)].

All erosion features are also recorded as separate entries (on separate lines) from the rule segment on which they occur. This allows the use of separate lengths (begin and end points) for the erosion features and their sources. In addition, Drainage problems that are not related to conditions covered by the Rules should be identified on a separate row.

Modified Completion Report		
<b>Road FPR Pick List (Column C)</b>		
Revised 8-11-00		
Type	Rule No.	Description
waterbreaks	914.6(c) 934.6(c) 954.6(c)	Waterbreak spacing according to standards
	914.6 (f) 934.6 (f) 954.6 (f)	Where waterbreaks don't work--other erosion controls
	914.6(g) 914.6(g) 954.6(g)	Waterbreaks constructed with a depth of at least 6 inches cut into firm roadbed
Roads	923.1(a) 943.1(a) 963.1(a)	Road shown on THP map correctly
	923.1(a) 943.1(a) 963.1(a)	If landing on road >1/4 ac or required substantial excavation-shown on map
	923.1(c) 943.1(c) 963.1(c)	Logging roads and landings shall be planned and located, when feasible, to avoid unstable areas
	923.1(d) 943.1(d) 963.1(d)	For slopes >65% or 50% within 100 ft of WLPZ, soil treated to minimize erosion
	923.1(e) 943.1(e) 963.1(e)	New logging roads shall not exceed a grade of 15%, except that for 500' pitches with max. 20% grades.
	923.1(f) 943.1(f) 963.1(f)	Adequate numbers of drainage facilities provided to minimize erosion

	923.1(g) 943.1(g) 963.1(g)	New roads shall be single lane with turnouts, and constructed with balanced cut and fills where feasible.
	923.1(h) 943.1(h) 963.1(h)	Road construction shall be planned to stay out of WLPZs.
	923.1(h) 943.1(h) 963.1(h)	If logging roads will be used from the period of October 15 to May 1, hauling shall not occur when saturated soil conditions exist on the road.
	923.2(b) 943.2(b) 963.2(b)	Sidecast minimized for slopes >65% for distances >100 feet
	923.2(c) 943.2(c) 963.2(c)	Compacted fill on roads with >50% sideslopes.
	923.2(d) 943.2(d) 963.2(d)	Fills constructed with insloping approaches, etc.
	923.2(e) 943.2(e) 963.2(e)	Breaks in grade above/below throughfill
	923.2(f) 943.2(f) 963.2(f)	On 35% sideslopes remove organic layer of soil prior to placing fill.
	923.2(g) 943.2(g) 963.2(g)	Proper placement of excess material to avoid polluting streams.
	923.2(h) 943.2(h) 963.2(h)	Drainage structures of sufficient size, number and location to carry runoff water
	923.2(h) 943.2(h) 963.2(h)	Drainage structures of sufficient size, number and location to minimize erosion
	923.2(i) 943.2(i) 963.2(i)	Trash racks, etc. installed where appropriate
	923.2(j) 943.2(j) 963.2(j)	No wood debris in road fills.
	923.2(k) 943.2(k) 963.2(k)	No overhanging banks.

	923.2(l) 943.2(l) 963.2(l)	Fell trees >12" dbh with >25% of roots exposed by road.
	923.2(m) 943.2(m) 963.2(m)	Sidecast extending >20 ft treated to avoid erosion
	923.2(o) 943.2(o) 963.2(o)	Discharge onto erodible fill prevented Waterbreaks installed to discharge into cover
	923.2(p) 943.2(p) 963.2(p)	Waterbreaks installed according to standards in 914.6
	923.2(q) 943.2(q) 963.2(q)	Drainage facilities in place and functional by October 15. Except waterbreaks on roads in use until rains begin to produce overland flow.
	923.2(s) 943.2(s) 963.2(s)	Completed road construction shall be drained by outsloping, waterbreaks and/or cross-draining by October 15.
	923.2(t) 943.2(t) 963.2(t)	Winter roads surfaced where necessary.
	923.2(u) 943.2(u) 963.2(u)	Slash and other debris from road construction placed so as not to discharge into class I and II streams.
	923.2(v) 943.2(v) 963.2(v)	Road construction activities in the WLPZ, except for stream crossings or specified in the THP, shall be prohibited.
	923.4(a) 943.4(a) 963.4(a)	Road maintenance completed during erosion control period.
	923.4(b) 943.4(b) 963.4(b)	Upon completion of timber operations, temporary roads and associated landing shall be abandoned properly (923.8)
	923.4(c) 943.4(c) 963.4(c)	Waterbreaks maintained to minimize erosion. Erosion controls maintained during maintenance period
	923.4(d) 943.4(d) 963.4(d)	Watercourse crossings facilities and drainage structures shall be kept open.
	923.4(e) 943.4(e) 963.4(e)	Roadside berm removed or breached, except where needed for erosion control.

	923.4(f) 943.4(f) 963.4(f)	50-year flow design minimum for drainage structures.
	923.4(g) 943.4(g) 963.4(g)	Temporary roads blocked by start of winter.
	923.4(h) 943.4(h) 963.4(h)	Prevent excessive loss of road surface.
	923.4(i) 943.4(i) 963.4(i)	Soil stabilization where needed to prevent discharge.
	923.4(j) 943.4(j) 963.4(j)	Drainage ditches maintained to allow flow of water
	923.4(k) 943.4(k) 963.4(k)	Prevent of discharge from cuts, fills and sidecast slopes.
	923.4(l) 943.4(l) 963.4(l)	Maintain trash racks.
	923.4(m) 943.4(m) 963.4(m)	Maintain drainage structures to prevent discharge.
	923.4(n) 943.4(n) 963.4(n)	Maintain drainage structures to prevent diversions.
	923.4(o) 943.4(o) 963.4(o)	Use heavy equipment road maintenance in WLPZ is prohibited during the wet season, except in emergencies.
	923.6 943.6 963.6	Wet spots rocked or otherwise treated

**Columns D and E** – Cumulative Distance: Enter the beginning and ending distances as indicated from the string box for the point where the rule being evaluated began to apply to the point where it no longer applies. There can be overlap between rules with subsequent ID numbers.

**Column F** – Impl. Code: Enter the implementation code that best describes the adequacy of rule application.

D (Departure)  
 MA (Marginally Acceptable)  
 A (Acceptable)  
 ER (Exceeds Rule/THP requirements)

## **Effectiveness factors to be evaluated** (Erosion control maintenance period)

**Column G** – Effectiveness Code: Enter the effectiveness code that best describes the adequacy of rule performance.

E (Excellent) = No evidence of erosion, more than adequate to function as intended and to meet past and expected site conditions.

A (Adequate) = Minor rilling that does not extend beyond feature outlet, adequate to function as intended and to meet past and expected site conditions.

MA (Marginally Adequate) = Presence of rilling or other erosion with deposition prior to watercourse, barely adequate to function as intended and to meet past and expected site conditions.

I (Inadequate) = Presence of rilling or other erosion that has reached a watercourse in significant quantity, not adequate to function as intended or to meet past and expected site conditions.

F (Failed) = Feature is no longer functional.

**Column H** – Drainage Problem Code: Enter the code(s) describing all drainage problems that are related to the road.

#### General Problem Codes

(Use for waterbars, rolling dips, culverts, outsloping, and other cross drains)

- S =Spacing: Spacing too wide as indicated by road surface erosion, road ditch erosion, large rills or gullyng in a cross drain ditch, or fill erosion from concentrated flow.
- A =Angle: The cross drain is not placed diagonally across the road grade with the outlet at the lower end.
- D =Divert: The cross drain does not capture all road runoff and divert it off the road surface.
- F =Flow: The cross drain does not provided unrestricted flow of runoff through the waterbar outlet.
- C =Cover: The cross drain does not discharge into some form of vegetative cover, duff, slash, rocks, or other less erodible material in a manner that will minimize erosion.
- T =Traffic: The cross drainage is no longer functional or function has been impaired by traffic (e.g. ruts in berm, ruts down outsloped road, ditch filled in).
- M =Maintenance: Cross drainage is no longer functional or function has been impaired as a direct result of improper maintenance.
- O =Other (describe under comments).

#### Waterbreak Problem Codes

- H =Height: Waterbar is not cut at least 6" into the roadbed or does not have an embankment that is at least 6" high adjacent to the lower edge of the waterbar cut.

#### Rolling Dip Problem Codes

- R =Rolling dip break in grade and ditch depth is not adequate to divert all road surface runoff.

#### Cross Drain Culvert Problem Codes

- P =Plugged inlet.
- G =Shotgun outlet without adequate armoring at point of discharge.
- I =Piping around outside of culvert.

#### Inside Ditch Problem Codes

- B =Blocked ditch (use with E below if runoff diverted from ditch).
- E =Runoff has escaped ditch and run down or across road surface.
- L =Location or placement is inappropriate to capture surface runoff.

**Column I** – Erosion Source: Enter a single code that describes the source (location) on which the erosion feature originates.

Erosion Source Codes

CS	=	Cut slope
ID	=	Inside ditch
RS	=	Road surface
FS	=	Fill slope
WD	=	Waterbar ditch
WO	=	Waterbar outlet
RD	=	Rolling dip ditch
RO	=	Rolling dip outlet
CI	=	Culvert inlet
CO	=	Culvert outlet
HA	=	Hillslope above road
HB	=	Hillslope below road
OE	=	Other erosion source (describe in comments)

Note: Hillslope source codes (HA or HB) should only be used when a road related feature is not the cause or a significant contributor to the recorded erosion feature.

**Column J** – Cause Code: Identify all of the causes that have contributed substantially to development of the recorded erosion feature. Use as many codes as needed.

Erosion Cause Codes (two types):

- 1) For **drainage feature problems** record a “D” in column J, and list specific problem in Column H.

D = Drainage feature problem (list specific probs. in column H)

- 2) For **non-drainage feature problems** record all of the following codes in Column J in column that apply.

E	=	Highly erosive surface material
U	=	Unstable terrain
T	=	Cut slope too tall
C	=	Cut slope too steep
L	=	Fill slope too long
F	=	Unstable fill (inadequate compaction, needed keyway, Original surface not scarified, etc.)
M	=	Organic matter in fill
S	=	Steep side slopes
G	=	Steep road gradient
R	=	Rutting
O	=	Other erosion cause (describe in comments)

**Columns K to M** – Dimensions: Record the estimated average surface width, average total depth, and total length (in feet), respectively, of the erosion feature. Measurements should be estimated in 0.1 foot increments for dimensions smaller than 1 foot and to 2 places for dimensions larger than one foot (for example: 0.5, 1.5, and 150). Dimensions should not be given for rills. Use of surface width and average total depth is specified so that volumes can be calculated using assumed cross section shapes based on these dimensions.

**Column N** – Deposition Code: Record in column N the single code corresponding to the closest approach of sediment from the listed erosion feature to the watercourse that it is directed toward. **This is a very important piece of information because it provides our best estimate of whether water quality has been affected.**

Sediment Deposition Codes

(Use in column M to indicate the closest approach of sediment from the recorded erosion feature to a watercourse)

NC	=	No transport to channel when WLPZ not present
NT	=	No transport to WLPZ.
TI	=	Transport into WLPZ.
TH	=	Transport to high flow channel.
TL	=	Transport to low flow channel.
TD	=	Transport to inside ditch.

Note: Determining the dimensions of gullies originating on transect features and continuing down the sideslope is likely to require leaving the road and following the feature to estimate both gully length and location of sediment deposition. When done by the person making transect length measurements, this will require removing the string box and leaving it on the road or trail.

**Column O** – Record in column O the single code for the watercourse class that sediment has been directed toward. This may require reference to the THP watercourse classification map.

Watercourse Codes

(Use in column N to indicate watercourse class that sediment is directed toward.)

W0	=	No class channel
W1	=	Class I watercourse
W2	=	Class II watercourse
W3	=	Class III watercourse
W4	=	Class IV watercourse

**Column P** – Comments: Record comments about site conditions and describe features, problems, etc. for which no specific codes have been provided. When comments exceed the space provided in column P, a clear reference must be provided to a longer description on the back of the transect form or on separate sheet(s). All forms and separate comment sheets should be stapled together.

-----**End of the Road Form Codes**-----

### 3) **Watercourse Crossing Sampling Method**

Two watercourse crossings will be sampled for each selected THP, if available. Each watercourse crossing will be rated twice:

1. At the time of the Completion Report, fill out the site information portion of the form and rate implementation of appropriate Forest Practice Rules for the crossing (use list provided and supplement where needed. (Example completed form in Figure E. Blank form in Appendix 6.)
2. After at least one overwintering period (but during the Erosion Control Maintenance Period), use the same form and rate the effectiveness of practices implemented at the watercourse crossing . (Example completed form in Figure F. Blank form in Appendix 7.)

**Selecting the two crossings to be sampled.** When watercourse crossings (for Class I, II, or III watercourses-either permanent or abandoned) are encountered during the 1000-foot road transect, they are utilized for the MCR program. If the crossing occurs within a road transect, the crossing will be noted as a feature and the transect will be continued to the end. The inspector will then return to the crossing and conduct the watercourse crossing evaluation. Inspectors will sample the first feature that becomes available (inspectors should not be concerned that the crossings are not distributed throughout the THP area, or that similar types of crossings are being evaluated).

If no crossings occur within the road transect, then inspectors will determine from the THP map the closest watercourse crossings relative to the randomly chosen road transect. If there are no watercourse crossings associated with roads, locate and evaluate the nearest skid trail crossings (if available). If there are no watercourse crossings on the THP, then this will be noted at the start of a Watercourse Crossing form package.

**Instructions for Watercourse Crossings.** Locate the sample watercourse crossing as described above. The length of road to be evaluated is determined by walking in both directions from the crossing and identifying the points where drainage from the road surface, cuts, and fills no longer carries to the watercourse crossing. The evaluation includes the cut-off drainage structure that should route water away from the crossing. The road length for evaluation lies between these points. Inspect this portion of the road and the crossing itself for evidence of the following factors and complete the Watercourse Crossing Effectiveness Ratings form.

Two watercourse crossing rating forms are included in the appendix. One is for rating “Implementation” , and the other is for rating “Effectiveness.”

The Implementation form is fairly straight-forward. First fill-out the site information. Then for each of the Forest Practice Rules that apply (FPR 923.2(d) through 923.8(e)) using one of four implementation codes, including:

- D (Departure)
- MA (Marginally Acceptable)
- A (Acceptable)
- ER (Exceeds Rule/THP requirements)

The effectiveness form requires that the inspector check one of three ratings boxes that best characterize each of 27 parameters. Write “N/A” after parameters that do not apply to the crossing being rated. An expanded description of each of those parameters is listed below.

**Rate the following items for effectiveness where they apply:**

## **FILL SLOPES**

Gullies: Gullies are greater than 6" deep. Determine as best as possible, if the gullies appear to be enlarging and whether there is deposition into watercourse channels.

Cracks: As you survey the fillslopes, also note any evidence of cracks on the slope. Often these are present at the upper edge of the fillslope. Cracks are common as fill settles. Assess whether the cracks appear to be stabilized or widening (active). Look for signs of vegetation, litter or rounded edges in older features, and for sharp edges on recent cracking.

Slope Failures: While surveying the fillslope, note instances of slope failure. Slope failures are evidenced by movement of soil in blocks or large clumps, rather than by rills, gullies or sheet erosion. Estimate whether the failures total between 0 and 1 cubic yard, or greater than one cubic yard.

## **ROAD SURFACE DRAINING TO THE CROSSING**

Gullies: Determine if gullies are present on the road surface draining towards the crossing. Determine if the gullies appear to be enlarging and whether there is deposition into watercourse channels.

Cutoff Drainage Structure: Evaluate the cutoff drainage structures and determine if they are preventing the passage of water down to the crossing location.

Inside Ditch Condition: If an inside ditch is present, evaluate its condition and how functional it is in routing water down to the inlet of the culvert.

Ponding: Observe the road surface for evidence of ponding of surface runoff. Normally, ponds form at the low points of the surface, where a berm or other feature prevents drainage. Minor ponding is to be expected, so examine the fillslope below areas where ponding is evident, to determine if the ponding has resulted or could result in slippage of the fill.

Rutting (from vehicles): Determine if ruts from vehicles are present, and whether the ruts impair road drainage.

## **CULVERT DESIGN/CONFIGURATION**

Crossing Failure: Observe whether the crossing failed.

Scour at Inlet and Outlet: Observe the stream channel at both the inlet and outlet of the culvert. Estimate the total amount of scour that has occurred and is likely to occur in the next 2 years, and rate accordingly.

Diversion Potential: Examine the grade of the roadway at the crossing. If the crossing fails (plugs up or fails to carry all of the flow), will the stream be diverted out of its channel and down the roadway, or will flow continue across the road and down the channel?

Plugging: Examine the inlet of the culvert and determine the presence and degree of blocking of the capacity of the culvert by debris (woody debris, soil or rock).

Alignment: Observe the channel as it enters the culvert inlet and determine if there is basically a straight shot for water and debris to enter the pipe, or if there is a considerable angle for the channel approach.

Degree of Corrosion: Take a screwdriver or similar tool and rate the competency of the metal for steel pipes.

Crushed Inlet/Outlet: Determine if machinery or other impacts have deformed the pipe inlet or outlet.

Pipe Length: Determine if the pipe length is appropriate for the fill placed at the crossing, or if the pipe length is causing erosion problems.

Gradient: Determine if the gradient is appropriate or inappropriate. Improper gradient is evident when the pipe inlet is set too low in the channel or too high in the fill.

Piping: Examine the crossing fill and determine if piping of water is occurring, whereby water is passing through the fill without going through the culvert.

## **NON-CULVERT CROSSINGS (e.g., Rocked Class III crossings)**

Armoring: Evaluate the armoring present and determine if it is preventing downcutting at the crossing location.

Scour at Outlet: Observe the stream channel at the outlet of the crossing. Estimate the total amount of scour that has occurred and is likely to occur in the next 2 years, and rate accordingly.

Diversion of Flow: Examine the watercourse crossing and approaches to determine if they have been maintained to prevent diversion of stream overflow down the road should the drainage structure become plugged.

## **REMOVED OR ABANDONED CROSSINGS**

Bank Stabilization: Determine if there is stabilization of exposed soil on bank cuts that prevents transport of deleterious quantities of eroded surface soils to a watercourse.

Gullies: Gullies are greater than 6" deep. Determine if the gullies appear to be enlarging and whether there is deposition into watercourse channels.

Slope Failure: Slope failures are evidenced by movement of soil in blocks or large clumps, rather than by rills, gullies or sheet erosion. Estimate whether the failures total less than 1 cubic yard, greater than one cubic yard without channel entry, or greater than 1 cubic yard and deposition.

Channel Configuration: Examine restored channel configuration to determine if it is wider than the natural channel, and as close as feasible to the natural watercourse grade and orientation.

Excavated Material: Examine location of excavated material to determine if they are sloped back from the channel and stabilized to prevent slumping and minimize input in to the channel.

Maintenance Free Drainage: Determine if the abandonment procedure is, and will continue to, provide permanent, maintenance free drainage.

## Watercourse Crossing

### Site Information

revised 11/6/2000

THP No. 4-97-XX Crossing No. 1 Reviewer Tom Franis  
Clay Benda Date 9-13-00

Watercourse Class (circle one) I II III or IV  
Type of road Temp. (permanent, seasonal, temporary, abandoned)  
Type of crossing Temporary (culvert, bridge, pipe arch, ford)  
Current status abandoned (existing, abandoned)  
Culvert diameter N/A (inches, if appropriate)  
Installation (circle one) 1) Existing prior to THP or 2) New

### Implementation

Use the following codes to rate implementation: **D** (Departure) **MA** (Marginally Acceptable)  
**A** (Acceptable) **ER** (Exceeds Rule/THP Requirements) **N/A** (Not Applicable)

Rule No.	Description	Implementation Code/Comments
<b>ROADS</b>		<u>N/A</u>
923.2(d)(C)	fills across channels built to minimize erosion	<u>N/A</u>
923.2(h)	size, #, location of structures okay to carry runoff	<u>N/A</u>
923.2(h)	size, #, location of structures minimizes erosion	<u>N/A</u>
923.2(h)	size, #, location of structures-nat. drainage pattern	<u>N/A</u>
923.2(i)	trash racks, etc installed to minimize blockage	<u>N/A</u>
923.2(o)	no discharge on fill unless energy dissipators	<u>D</u>
923.3(a)	permanent xings shown on THP map, diameters	<u>N/A</u>
923.3 (c)	unrestricted passage of fish allowed	<u>N/A</u>
923.3(d)(1)	removed--fills excavated to reform channel	<u>D</u>
923.3(d)(2)	removed--cut bank sloped back to stop slumping	<u>A</u>
923.3(d)(2) req.	where needed, stabilizing treatment applied	<u>A</u>
923.3(e)	crossing/fills built/maintained to prevent diversion	<u>N/A</u>
923.4(c)	waterbreaks maintained to divert into cover	<u>A</u>
923.4(d)	crossing open to unrestricted passage of water	<u>A</u>
923.4(d)	trash racks installed where needed at inlets	<u>N/A</u>
923.4(f)	100-year flood flow requirement/ or removed	<u>A</u>
923.4(l)	Drainage structure/trash rack maintained	<u>N/A</u>
923.4(m)	Inlet/outlet, etc repaired/replaced as needed	<u>N/A</u>
923.4(n)	xing/approaches maintained to avoid diversion	<u>A</u>
923.8	abandonment--maintenance free drainage	<u>D</u>
923.8	abandonment--min.concentration of runoff	<u>A</u>
923.8(b)	abandonment--stabilization of exposed cuts/fills	<u>A</u>
923.8 (c)	abandonment--grading of road for dispersal	<u>A</u>
923.8(d)	abandonment--pulling/shaping of fills	<u>D</u>
923.8(e)	abandonment--fills excavated to reform channel	<u>A</u>
923.8(e)	abandonment--cutbanks sloped back	<u>D</u>
923.8(e)	removal not feasible--diversion potential handled	<u>N/A</u>
<b>SKID TRAILS (only)</b>		
914.8(b)	Structure (bridge, culvert, etc.) used where water present during life of the crossing	<u>NA</u>
914.8(c)	Unrestricted fish passage in Class I watercourse	<u>N/A</u>
914.8 (d)	Skid x-ing fill removed & banks sloped properly	<u>N/A</u>

Road Prism  
not fully  
removed

Approx 20 yds.  
remain in  
channel

**Fill Slopes**

- |                         |                              |  |   |  |
|-------------------------|------------------------------|--|---|--|
| 1) Gullies (>6 in deep) | <input type="checkbox"/> N/A | <input checked="" type="checkbox"/> None | <input type="checkbox"/> Small gullies, but not enlarging | <input type="checkbox"/> Large gullies and enlarging       |
| 2) Cracks               | <input type="checkbox"/> N/A | <input checked="" type="checkbox"/> None | <input type="checkbox"/> cracks present but stabilized    | <input type="checkbox"/> cracks threaten integrity of fill |
| 3) Slope Failure        | <input type="checkbox"/> N/A | <input checked="" type="checkbox"/> None | <input type="checkbox"/> 0-1 cubic yard                   | <input type="checkbox"/> >1 cubic yard                     |

**Road Surface Draining to Crossing**

- |                              |   |                                     |   |   |
|------------------------------|---|-------------------------------------|---|---|
| 1) Gullies (>6 in deep)      | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> None       | <input type="checkbox"/> Small gullies, but not enlarging                                 | <input type="checkbox"/> Large gullies and enlarging                                      |
| 2) Cutoff Drainage Structure | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> Functional | <input type="checkbox"/> Allows some water to reach crossing                              | <input type="checkbox"/> Allows all water to reach crossing                               |
| 3) Inside Ditch Condition    | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> Open       | <input type="checkbox"/> Some sediment/debris accumulation                                | <input type="checkbox"/> Blocked with sediment and debris                                 |
| 4) Ponding (on road/fills)   | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> None       | <input type="checkbox"/> Ponding present but does not threaten integrity of fill material | <input type="checkbox"/> Ponding present and threatens the integrity of the fill material |
| 5) Rutting                   |   | <input type="checkbox"/> None       | <input type="checkbox"/> Some ruts but drainage not impaired                              | <input type="checkbox"/> Rutting impairs road drainage                                    |

**Culvert Design/Configuration** Crossing has failed N/A YES or NO (circle one). Estimate cubic yards of fill lost \_\_\_\_\_ cu.yds.

- |                          |   |                                       |  |   |
|--------------------------|---|---------------------------------------|--|---|
| 1) Scour at Inlet        | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> None         | <input type="checkbox"/> Minor scour—not undercutting fill                             | <input type="checkbox"/> Major scour, maybe undercutting fill                                     |
| 2) Scour at Outlet       | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> None         | <input type="checkbox"/> Minor scour—not undercutting fill                             | <input type="checkbox"/> Major scour, maybe undercutting fill                                     |
| 3) Diversion Potential   | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> Not possible | <input type="checkbox"/> Road slopes downward in one direction with drainage structure | <input type="checkbox"/> If culvert fails, overflow will be diverted out of channel and down road |
| 4) Plugging              | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> None         | <input type="checkbox"/> Sediment/debris blocking <30%                                 | <input type="checkbox"/> Sediment/debris blocking >30% of inlet/outlet                            |
| 5) Alignment             | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> Appropriate  | <input type="checkbox"/> Low angle channel approach                                    | <input type="checkbox"/> High angle channel approach  |
| 6) Degree of Corrosion   | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> None/minor   | <input type="checkbox"/> Moderate—some metal missing                                   | <input type="checkbox"/> Severe—pipe easily punctured   |
| 7) Crushing Inlet/Outlet | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> None         | <input type="checkbox"/> Pipe deformed but <30% blocked                                | <input type="checkbox"/> Pipe deformed and >30% blocked   |
| 8) Pipe Length           | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> Appropriate  | <input type="checkbox"/> Length causing minor fill erosion                             | <input type="checkbox"/> Length related to major erosion around pipe                              |
| 9) Gradient              | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> Appropriate  | <input type="checkbox"/> Inlet slightly too low or high in fill                        | <input type="checkbox"/> Inlet too high or low—causing debris accumulation                        |
| 10) Piping               | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> None         |  | <input type="checkbox"/> Flow passes beneath or around culvert                                    |

**Non-Culverted Crossing**

- |                            |   |                                       |  |   |
|----------------------------|---|---------------------------------------|--|---|
| 1) Armoring (gravel/paved) | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> Appropriate  | <input type="checkbox"/> Minor downcutting evident   | <input type="checkbox"/> Major downcutting evident            |
| 2) Scour at Outlet         | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> None         | <input type="checkbox"/> Minor scour—not undercutting fill                                 | <input type="checkbox"/> Major scour, maybe undercutting fill |
| 3) Diversion               | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> Not possible | <input type="checkbox"/> Road slopes downward in one direction but unlikely to divert flow | <input type="checkbox"/> Overflow will be diverted down road  |

**Removed/Abandoned Crossings**

- |                              |   |  |  |   |
|------------------------------|---|--|--|---|
| 1) Bank Stabilization        | <input type="checkbox"/> N/A            | <input type="checkbox"/> Dense cover or stabilized | <input checked="" type="checkbox"/> >50% of banks with groundcover and/or stabilized | <input type="checkbox"/> <50% of banks have effective cover or stabilized |
| 2) Gullies (>6 in deep)      | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> None                      | <input type="checkbox"/> Small gullies, not enlarging                                | <input type="checkbox"/> Large gullies and enlarging                      |
| 3) Slope Failure             | <input type="checkbox"/> N/A            | <input type="checkbox"/> <1 cu yd                  | <input type="checkbox"/> >1 cu yd but does not enter stream                          | <input checked="" type="checkbox"/> >1 cu yd and enters channel           |
| 4) Channel Configuration     | <input type="checkbox"/> N/A            | <input type="checkbox"/> Near natural              | <input type="checkbox"/> Minor difference from natural channel                       | <input checked="" type="checkbox"/> Major difference from natural channel |
| 5) Excavated Material        | <input type="checkbox"/> N/A            | <input type="checkbox"/> Sloped to min. erosion    | <input type="checkbox"/> <1 cubic yard transported to channel                        | <input checked="" type="checkbox"/> >1 cubic yard transported to channel  |
| 6) Maintenance Free Drainage | <input type="checkbox"/> N/A            | <input type="checkbox"/> Sufficient                | <input type="checkbox"/> Minor problem(s) noted                                      | <input checked="" type="checkbox"/> Major problem(s) noted                |

## **Appendices**

Randomly selected THP numbers for THPS by date.....	appendix A-1
(Appendices A-2a and A-2b modified on 2-25-02 and into consolidated A-1 on 3-12-02,)	
WLPZ canopy form.....	appendix A-3
WLPZ erosion features form.....	appendix A-4
Roads transect form.....	appendix A-5
Watercourse site information and implementation form.....	appendix A-6
Watercourse effectiveness form.....	appendix A-7
Random number table.....	appendix A-8
(Provided for convenience. Any random number table or random number generating calculator may used to randomly select road segments and WLPZ reaches.)	

## **MODIFIED COMPLETION REPORT**

Four lists of **RANDOMLY SELECTED THPS** by year.

(Revised 2/25/02 to reflect a reduction in sample size to 12.5%.)

When at a THP comes up for final Completion Report field inspection, go to the appropriate list below (based on the year date in the THP number). If the THP number shows up on the list, then a Modified Completion Report (MCR) should be done on this THP.

For THP numbers (Region#)-90-XXX thru (Region#)-99-XXX use the  
Years 1990 thru 1999 list.

For THP numbers (Region#)-00-XXX use the Year 2000 list.

For THP numbers (Region#)-01-XXX use the Year 2001 list.

For THP numbers (Region#)-02-XXX use the Year 2002 list.

The lists are the same for all Regions and represent a 12.5% random sample. The sample size was reduced from 25% to 12.5% on 2/25/02.

Additional MCR field training is available on request. MCR Methods and Procedures are available in hardcopy and on the CDF intranet site in the Resource Management section. If you have questions, please contact Clay Brandow via email at [clay\\_brandow@fire.ca.gov](mailto:clay_brandow@fire.ca.gov) or by phone at (916) 653-0719.

MODIFIED COMPLETION REPORT

RANDOMLY SELECTED THPS

USE THIS LIST FOR THPS DATED **1990 THRU 1999** (revised 2/25/02)

4	211	403	637	859
13	214	405	651	871
16	216	423	654	874
20	217	424	655	880
31	224	426	664	882
50	244	428	688	894
56	248	449	690	895
80	254	454	704	896
84	262	491	706	901
85	273	511	708	905
90	279	520	738	907
91	281	527	746	910
101	283	533	758	921
110	290	549	761	926
117	295	552	762	930
138	322	561	772	945
146	330	566	774	952
148	342	576	783	956
155	343	601	784	960
161	346	609	796	961
173	349	616	810	964
185	361	618	811	977
188	363	622	812	979
190	369	625	818	998
194	385	627	847	999
206	395	634	848	

MODIFIED COMPLETION REPORT

RANDOMLY SELECTED THPS

USE THIS LIST FOR THPS DATED **2000** (revised 2/25/02)

2	177	385	577	759
5	183	403	600	765
6	185	408	610	767
8	189	418	621	779
13	215	421	622	781
19	228	423	627	789
20	239	436	639	806
32	242	445	647	812
38	275	457	654	824
43	279	458	669	830
55	282	467	673	832
64	290	470	677	839
67	297	478	694	840
70	310	484	701	849
85	311	487	704	895
87	320	489	705	904
108	322	490	709	908
112	333	506	712	928
118	342	521	718	937
119	348	522	719	938
123	363	524	722	944
124	367	525	724	972
126	373	526	732	976
155	380	536	741	981
175	384	574	748	999

MODIFIED COMPLETION REPORT

RANDOMLY SELECTED THPS

USE THIS LIST FOR THPS DATED 2001 (revised 2/25/02)

3	190	377	580	806
4	194	402	584	818
10	200	413	587	820
21	201	424	590	840
43	202	426	597	845
60	208	428	621	849
69	215	429	635	856
87	216	430	636	861
93	225	449	638	865
95	230	451	676	876
96	237	452	692	880
97	243	453	698	884
105	256	459	699	891
124	259	472	702	896
127	264	473	718	902
141	290	478	720	920
147	309	489	721	944
149	311	505	723	945
153	345	508	749	960
158	346	511	752	962
159	350	512	759	972
162	354	524	763	979
169	357	534	764	981
173	373	549	784	985
186	376	559	804	994

MODIFIED COMPLETION REPORT

RANDOMLY SELECTED THPS

USE THIS LIST FOR THPS DATED 2002 (created 2/25/02)

3	181	365	543	758
5	182	370	561	761
9	187	383	585	772
10	189	389	590	776
20	190	400	619	803
26	220	406	624	804
30	226	420	627	825
34	230	437	631	830
35	242	451	638	840
37	243	453	642	848
53	244	459	643	858
57	280	462	652	871
71	284	471	664	875
87	285	474	669	888
89	309	479	672	891
108	311	486	689	911
135	329	493	692	935
148	334	499	695	943
155	336	500	701	950
163	342	508	721	951
164	351	511	728	962
168	352	538	734	986
172	363	539	738	991

MODIFIED COMPLETION REPORT  
RANDOMLY SELECTED THPS  
USE THIS LIST FOR THPS DATED 2003

16	241	470	658	892
27	255	475	664	911
39	266	479	665	915
54	274	480	674	918
59	287	487	679	919
78	296	490	689	922
83	302	508	692	925
86	320	515	694	931
92	322	520	705	932
100	336	521	715	934
101	338	522	722	947
111	346	527	725	950
116	358	543	728	953
124	362	550	730	970
137	373	561	733	972
142	377	564	735	986
145	386	586	738	990
160	389	587	743	993
173	404	592	744	996
181	428	600	755	997
186	433	620	769	
198	439	629	778	
205	444	633	785	
212	445	638	799	
221	447	646	816	
222	453	655	859	
232	464	656	882	

# Modified Completion Report

## WLPZ Canopy Sampling Form

Revised 10/16/2000

A-3

THP No. \_\_\_\_\_

Observer(s) \_\_\_\_\_

Date \_\_\_\_\_

Estimate total length of Class I stream in this THP \_\_\_\_\_ feet.

Estimate total length of Class II stream in this THP \_\_\_\_\_ feet.

(Count the number of 200 segments delineated on the THP map for the random selection of a sample 200 foot WLPZ segment and multiply by 200. Needed for statistical analysis.)

Watercourse selected for sampling:

Watercourse Name \_\_\_\_\_

Watercourse Class I or II (circle one)

Target WLPZ sample length is 200 feet.

Actual WLPZ sample length \_\_\_\_\_ feet

Prescribed WLPZ width (from THP) \_\_\_\_\_ feet

Actual WLPZ width (based on flagging) \_\_\_\_\_ feet

Sampled WLPZ width \_\_\_\_\_ feet

D = Distance between sample points.

$D = 2\sqrt{\text{width}} =$  \_\_\_\_\_ feet.

For standard widths of 50, 75, 100, 150, and 200 feet,

D is 14, 17, 20, 24, and 28 feet, respectively.

$100 \times (\# \text{ of Hits}) / (\# \text{ of Hits} + \# \text{ of Misses}) =$

\_\_\_\_\_ % Canopy Cover

**Ocular estimates** (within WLPZ sample segment).

Harvesting in WLPZ segment this entry? YES NO (circle one)

% Canopy removed this entry? <10% 10-30% 30-50% (circle one)

Understory Canopy remaining  $\geq$  50%? YES NO (circle one)

Overstory Canopy remaining  $\geq$  50%? YES NO (circle one)

T&I planning watersheds/Class I watercourses only,

overstory meets T&I standards: N/A YES NO (circle one)

WLPZ Groundcover (live & dead) is  $\leq$ 70% or  $\geq$ 70% (circle one).

Untreated patches of bare mineral soil in WLPZ ( $\geq$ 800 ft<sup>2</sup> or as specified in the THP) are: Absent or Present (circle one).

Points	Hit (+)	Miss (-)
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
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12.		
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45.		
46.		
47.		
48.		
49.		
50.		
Totals		

# Modified Completion Report WLPZ Erosion Features Form

Revised 4/2/01

**A-4**

Page \_\_\_\_ of \_\_\_\_

Observer(s) \_\_\_\_\_

Date \_\_\_\_\_

THP No. \_\_\_\_\_

Name of Affected Watercourse \_\_\_\_\_

Check one:

☐ No erosion features observed in sample WLPZ segment.

☐ Erosion features observed in sample WLPZ segment and described below.

Point Number (Nearest WLPZ canopy measurement point.)	Erosion Feature Type (Gully, rills, or sediment deposition.)	Width (feet)	Depth (feet)	Length (feet)	Comments  (source of the sediment) (cause of the problem) (deposition to the channel)



# Watercourse Crossing

## Site Information

revised 11/6/2000

A-6

THP No. \_\_\_\_\_ Crossing No. \_\_\_\_\_ Reviewer \_\_\_\_\_ Date \_\_\_\_\_

Watercourse Class (circle one) I II III or IV

Type of road \_\_\_\_\_ (permanent, seasonal, temporary, abandoned)

Type of crossing \_\_\_\_\_ (culvert, bridge, pipe arch, ford)

Current status \_\_\_\_\_ (existing, abandoned)

Culvert diameter \_\_\_\_\_ (inches, if appropriate)

Installation (circle one) 1) Existing prior to THP or 2) New

## Implementation

Use the following codes to rate implementation: **D** (Departure) **MA** (Marginally Acceptable)  
**A** (Acceptable) **ER** (Exceeds Rule/THP Requirements) **N/A** (Not Applicable)

Rule No.	Description	Implementation Code/Comments
<b>ROADS</b>		
923.2(d)(C)	fills across channels built to minimize erosion	
923.2(h)	size, #, location of structures okay to carry runoff	
923.2(h)	size, #, location of structures minimizes erosion	
923.2(h)	size, #, location of structures-nat.drainage pattern	
923.2(i)	trash racks, etc installed to minimize blockage	
923.2(o)	no discharge on fill unless energy dissipators	
923.3(a)	permanent xings shown on THP map, diameters	
923.3 (c)	unrestricted passage of fish allowed	
923.3(d)(1)	removed--fills excavated to reform channel	
923.3(d)(2)	removed--cut bank sloped back to stop slumping	
923.3(d)(2) <i>req.</i>	where needed, stabilizing treatment applied	
923.3(e)	crossing/fills built/maintained to prevent diversion	
923.4(c)	waterbreaks maintained to divert into cover	
923.4(d)	crossing open to unrestricted passage of water	
923.4(d)	trash racks installed where needed at inlets	
923.4(f)	100-year flood flow requirement/ or removed	
923.4(l)	Drainage structure/trash rack maintained	
923.4(m)	Inlet/outlet, etc repaired/replaced as needed	
923.4(n)	xing/approaches maintained to avoid diversion	
923.8	abandonment--maintenance free drainage	
923.8	abandonment--min.concentration of runoff	
923.8(b)	abandonment--stabilization of exposed cuts/fills	
923.8 (c)	abandonment--grading of road for dispersal	
923.8(d)	abandonment--pulling/shaping of fills	
923.8(e)	abandonment--fills excavated to reform channel	
923.8(e)	abandonment--cutbanks sloped back	
923.8(e)	removal not feasible--diversion potential handled	
<b>SKID TRAILS (only)</b>		
914.8(b)	Structure (bridge, culvert, etc.) used where water present during life of the crossing	
914.8(c)	Unrestricted fish passage in Class I watercourse	
914.8 (d)	Skid x-ing fill removed & banks sloped properly	

THP No. \_\_\_\_\_

Crossing No. \_\_\_\_\_ Reviewer \_\_\_\_\_

Date \_\_\_\_\_

**Fill Slopes**

- |                         |                              |                               |   |  |
|-------------------------|------------------------------|-------------------------------|---|--|
| 1) Gullies (>6 in deep) | <input type="checkbox"/> N/A | <input type="checkbox"/> None | <input type="checkbox"/> Small gullies, but not enlarging | <input type="checkbox"/> Large gullies and enlarging       |
| 2) Cracks               | <input type="checkbox"/> N/A | <input type="checkbox"/> None | <input type="checkbox"/> cracks present but stabilized    | <input type="checkbox"/> cracks threaten integrity of fill |
| 3) Slope Failure        | <input type="checkbox"/> N/A | <input type="checkbox"/> None | <input type="checkbox"/> 0-1 cubic yard                   | <input type="checkbox"/> >1 cubic yard                     |

**Road Surface Draining to Crossing**

- |                              |                               |                                     |   |   |
|------------------------------|-------------------------------|-------------------------------------|---|---|
| 1) Gullies (>6 in deep)      | <input type="checkbox"/> N/A  | <input type="checkbox"/> None       | <input type="checkbox"/> Small gullies, but not enlarging                                 | <input type="checkbox"/> Large gullies and enlarging                                      |
| 2) Cutoff Drainage Structure | <input type="checkbox"/> N/A  | <input type="checkbox"/> Functional | <input type="checkbox"/> Allows some water to reach crossing                              | <input type="checkbox"/> Allows all water to reach crossing                               |
| 3) Inside Ditch Condition    | <input type="checkbox"/> N/A  | <input type="checkbox"/> Open       | <input type="checkbox"/> Some sediment/debris accumulation                                | <input type="checkbox"/> Blocked with sediment and debris                                 |
| 4) Ponding (on road/fills)   | <input type="checkbox"/> N/A  | <input type="checkbox"/> None       | <input type="checkbox"/> Ponding present but does not threaten integrity of fill material | <input type="checkbox"/> Ponding present and threatens the integrity of the fill material |
| 5) Rutting                   | <input type="checkbox"/> None | <input type="checkbox"/> None       | <input type="checkbox"/> Some ruts but drainage not impaired                              | <input type="checkbox"/> Rutting impairs road drainage                                    |

**Culvert Design/Configuration** Crossing has failed **N/A** YES or NO (circle one). Estimate cubic yards of fill lost \_\_\_\_\_ cu.yds.

- |                          |                              |                                       |  |   |
|--------------------------|------------------------------|---------------------------------------|--|---|
| 1) Scour at Inlet        | <input type="checkbox"/> N/A | <input type="checkbox"/> None         | <input type="checkbox"/> Minor scour—not undercutting fill                             | <input type="checkbox"/> Major scour, maybe undercutting fill                                     |
| 2) Scour at Outlet       | <input type="checkbox"/> N/A | <input type="checkbox"/> None         | <input type="checkbox"/> Minor scour—not undercutting fill                             | <input type="checkbox"/> Major scour, maybe undercutting fill                                     |
| 3) Diversion Potential   | <input type="checkbox"/> N/A | <input type="checkbox"/> Not possible | <input type="checkbox"/> Road slopes downward in one direction with drainage structure | <input type="checkbox"/> If culvert fails, overflow will be diverted out of channel and down road |
| 4) Plugging              | <input type="checkbox"/> N/A | <input type="checkbox"/> None         | <input type="checkbox"/> Sediment/debris blocking <30%                                 | <input type="checkbox"/> Sediment/debris blocking >30% of inlet/outlet                            |
| 5) Alignment             | <input type="checkbox"/> N/A | <input type="checkbox"/> Appropriate  | <input type="checkbox"/> Low angle channel approach                                    | <input type="checkbox"/> High angle channel approach  |
| 6) Degree of Corrosion   | <input type="checkbox"/> N/A | <input type="checkbox"/> None/minor   | <input type="checkbox"/> Moderate—some metal missing                                   | <input type="checkbox"/> Severe—pipe easily punctured   |
| 7) Crushing Inlet/Outlet | <input type="checkbox"/> N/A | <input type="checkbox"/> None         | <input type="checkbox"/> Pipe deformed but <30% blocked                                | <input type="checkbox"/> Pipe deformed and >30% blocked   |
| 8) Pipe Length           | <input type="checkbox"/> N/A | <input type="checkbox"/> Appropriate  | <input type="checkbox"/> Length causing minor fill erosion                             | <input type="checkbox"/> Length related to major erosion around pipe                              |
| 9) Gradient              | <input type="checkbox"/> N/A | <input type="checkbox"/> Appropriate  | <input type="checkbox"/> Inlet slightly too low or high in fill                        | <input type="checkbox"/> Inlet too high or low—causing debris accumulation                        |
| 10) Piping               | <input type="checkbox"/> N/A | <input type="checkbox"/> None         |  | <input type="checkbox"/> Flow passes beneath or around culvert                                    |

**Non-Culverted Crossing**

- |                             |                              |                                       |  |   |
|-----------------------------|------------------------------|---------------------------------------|--|---|
| 1) Armoring (gravel/paved ) | <input type="checkbox"/> N/A | <input type="checkbox"/> Appropriate  | <input type="checkbox"/> Minor downcutting evident   | <input type="checkbox"/> Major downcutting evident            |
| 2) Scour at Outlet          | <input type="checkbox"/> N/A | <input type="checkbox"/> None         | <input type="checkbox"/> Minor scour—not undercutting fill                                 | <input type="checkbox"/> Major scour, maybe undercutting fill |
| 3) Diversion                | <input type="checkbox"/> N/A | <input type="checkbox"/> Not possible | <input type="checkbox"/> Road slopes downward in one direction but unlikely to divert flow | <input type="checkbox"/> Overflow will be diverted down road  |

**Removed/Abandoned Crossings**

- |                              |                              |  |   |   |
|------------------------------|------------------------------|--|---|---|
| 1) Bank Stabilization        | <input type="checkbox"/> N/A | <input type="checkbox"/> Dense cover or stabilized | <input type="checkbox"/> >50% of banks with groundcover and/or stabilized | <input type="checkbox"/> <50% of banks have effective cover or stabilized |
| 2) Gullies (>6 in deep)      | <input type="checkbox"/> N/A | <input type="checkbox"/> None                      | <input type="checkbox"/> Small gullies, not enlarging                     | <input type="checkbox"/> Large gullies and enlarging                      |
| 3) Slope Failure             | <input type="checkbox"/> N/A | <input type="checkbox"/> <1 cu yd                  | <input type="checkbox"/> >1 cu yd but does not enter stream               | <input type="checkbox"/> >1 cu yd and enters channel                      |
| 4) Channel Configuration     | <input type="checkbox"/> N/A | <input type="checkbox"/> Near natural              | <input type="checkbox"/> Minor difference from natural channel            | <input type="checkbox"/> Major difference from natural channel            |
| 5) Excavated Material        | <input type="checkbox"/> N/A | <input type="checkbox"/> Sloped to min. erosion    | <input type="checkbox"/> <1 cubic yard transported to channel             | <input type="checkbox"/> >1 cubic yard transported to channel             |
| 6) Maintenance Free Drainage | <input type="checkbox"/> N/A | <input type="checkbox"/> Sufficient                | <input type="checkbox"/> Minor problem(s) noted                           | <input type="checkbox"/> Major problem(s) noted                           |